

WHAT IS CLAIMED IS:

1. A motor driving method for a steering apparatus, comprising the steps of:

5 providing two motors for applying an auxiliary steering force to a steering system;

in operating the two motors, operating one of the two motors first; and

after operating the first motor, operating the other motor.

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2. A motor driving method according to claim 1, wherein in the step of operating one of the motors first, the two motors are used alternately.

15 3. A motor driving method according to claim 1, wherein in the step of operating one of the motors first, the same motor is always used.

4. A motor driving method according to claim 3, wherein when the steering direction is one direction a first of the motors is operated first and then the second motor is operated, and when the steering direction is the other direction the second motor is operated first and then the first motor is operated.

20 5. A motor driving method according to claim 1, wherein the output capacities of the two motors are different.

6. A motor driving method according to claim 1, wherein when only

one of the motors is being operated, motor failure detection is carried out.

7. An electric power steering apparatus for use in a vehicle,  
5 comprising:

a plurality of motors for applying a force to steering road wheels in a steering direction; and

allocating means for allocating auxiliary steering forces to the motors,

10 wherein the allocating means has current allocation determining means for, when at least one of the motors has failed, increasing the allocation of auxiliary steering force allocated to a normal motor.

15 8. An electric power steering apparatus according to claim 7, wherein the auxiliary steering forces correspond to motor currents allocated to the motors,

the allocating means further comprises current limit value setting means for setting current limit values for the motors, and

20 when at least one of the motors has failed, the current limit value setting means sets the current limit value of a normal motor to a failure current limit value and the allocating means allocates the motor currents in correspondence with the failure current limit value through the current allocation determining means, to which  
25 is inputted the failure current limit value.

9. An electric power steering apparatus according to claim 8,

wherein there are provided timing means for detecting whether or not the state of the current value of the normal motor being larger than a normal current limit value has continued for a predetermined time, and under the condition that the predetermined time continues,  
5 the current limit value setting means returns the current limit value from the failure current limit value to the normal current limit value.

10. A steering apparatus for transmitting a driving force of a  
10 motor through a gear mechanism to a rack shaft of a steering system and applying the driving force to steering road wheels in a steering direction, said apparatus comprising:

a first motor; and

a second motor,

15 wherein in the transmission of driving forces from output shafts of the first and second motors to the rack shaft the phases of the two motors are essentially staggered by 180°.

11. A steering apparatus according to claim 10, wherein the gear  
20 mechanism is a rack-and-pinion gear mechanism and in the meshing relationship of two pinion gears connected to the outputs shafts of the two motors and a rack gear the phases of the two pinion gears are essentially staggered by 180°.

25 12. A steering apparatus according to claim 10, wherein between the two motors a waveform pertaining to motor torque fluctuation arising from one of the motors and a waveform pertaining to motor

torque fluctuation arising from the other motor are set so as to be opposite in phase.

13. A steering apparatus according to claim 10, wherein the two  
5 motors are assisting motors of an electric power steering apparatus for supplementing a manual steering force.